

CLAIM AMENDMENTS

Claims 1-73 are currently pending. By the present amendment claims 1, 2, 7, 14-22, 24, 25, 27, 28 and 70-73 have been amended. No new claims have been added by this amendment.

Claim 1(currently amended): A method of providing a firm price quotation for a custom manufactured part, comprising:

~~(a) permitting a client to provide on a client computer a pre-existing computer aided design (CAD) file describing a three dimensional custom manufactured part of arbitrary shape determined by the client;~~

(a) ~~[(b)]~~ permitting the client to access receiving access on a server computer system from ~~the~~ a client computer over a global communication network;

(b) ~~[(c)]~~ uploading from the client computer to the server computer system a pre-existing computer aided design (CAD) file describing a three-dimensional custom manufactured part of arbitrary shape determined by a client ~~the pre-existing CAD file;~~

(c) ~~[(d)]~~ analyzing the pre-existing CAD file on the server computer system to determine one or more manufacturing criteria for the custom manufactured part of arbitrary shape;

(d) ~~[(e)]~~ calculating in the server computer system a firm price quotation for the custom manufactured part of arbitrary shape based upon the one or more manufacturing criteria; and

(e) [(f)] transmitting the price quotation to the client computer over the global communication network.

Claim 2(currently amended): The method of claim 1, wherein:

step (d) [(e)] is performed substantially instantly with a pre-programmed pricing formula.

Claim 3(original): The method of claim 2, wherein the pricing formula is in the form:

$$\text{price} = a * V + b * H + c;$$

where a, b and c are preprogrammed constants, where V is the volume of the part, and where H is a vertical dimension of the part in a selected orientation.

Claim 4(original): The method of claim 3, wherein:

the selected orientation of the part is selected to minimize H and thus minimize the calculated price.

Claim 5(original): The method of claim 3, wherein:

the pricing formula includes a finish charge dependent upon a selected finish and a surface area of the part.

Claim 6(original): The method of claim 3, wherein:

the pricing formula includes a multiple part charge dependent upon a quantity of parts quoted.

Claim 7(currently amended): The method of claim 1, further comprising:

prior to step (d) [(e)], permitting the client to select one of a plurality of available manufacturing processes; and

wherein step (d) [(e)] includes calculating the price quotation for the selected manufacturing process.

Claim 8(original): The method of claim 7, wherein:

the manufacturing process is an additive manufacturing process.

Claim 9(original): The method of claim 8, wherein:

the additive manufacturing process is a stereo lithography process.

Claim 10(original): The method of claim 8, wherein:

the additive manufacturing process is a selective laser sintering process.

Claim 11(original): The method of claim 8, wherein:

the additive manufacturing process is a fused deposition modeling process.

Claim 12(original): The method of claim 7, wherein:

the manufacturing process is a formative manufacturing process.

Claim 13(original): The method of claim 12, wherein:

the one or more manufacturing criteria includes volume of the part.

Claim 14(currently amended): The method of claim 7, wherein:

the manufacturing process includes the molding of parts from soft rubber tooling created using a pattern manufactured by an additive manufacturing process; and

step (d) [(e)] is performed with a pre-programmed pricing formula which includes a pattern part pricing formula, a tooling pricing formula, and a molded part pricing formula.

Claim 15(currently amended): The method of claim 7, wherein:

the manufacturing process includes injection molding of the parts from thermoplastic material using molds; and

step (d) [(e)] is performed with a pre-programmed pricing formula which includes a tooling pricing formula and a molded part pricing formula.

Claim 16(currently amended): The method of claim 1, wherein:

in step (c) [(d)], the one or more manufacturing criteria includes volume of the part.

Claim 17(currently amended): The method of claim 16, wherein:

in step (c) [(d)], the one or more manufacturing criteria includes the geometric extent of the part along multiple axes.

Claim 18(currently amended): The method of claim 17, wherein:

in step (c) [(d)], the one or more manufacturing criteria includes surface area of the part.

Claim 19(currently amended): The method of claim 1, wherein:

in step (c) [(d)], the one or more manufacturing criteria includes the geometric extent of the part along multiple axes.

Claim 20(currently amended): The method of claim 1, wherein:

in step (c) [(d)], the one or more manufacturing criteria includes surface area of the part.

Claim 21(currently amended): The method of claim 1, further comprising:

prior to step (d) [(e)], selecting one of a plurality of available materials; and
wherein step (d) [(e)] includes calculating the price quotation for the selected material.

Claim 22(currently amended): The method of claim 1, further comprising:

prior to step (d) [(e)], permitting the client to select one of a plurality of available surface finishes;

wherein in step (c) [(d)], the one or more manufacturing criteria includes surface area of the part; and

wherein in step (d) [(e)], the price quotation is dependent upon the selected surface finish and the surface area.

Claim 23(original): The method of claim 1, further comprising:

permitting the client to purchase the custom manufactured part online based upon the price quotation.

Claim 24(currently amended): The method of claim 1, further comprising:

prior to step (d) [(e)], permitting the client to select a quantity of the part greater than one; and

wherein step (d) [(e)] includes calculating the price quotation for the selected quantity, wherein the quantity price per unit is less than the price for a single unit.

Claim 25(currently amended): The method of claim 1, being further characterized as a method for providing a firm price quotation for a buildset including a plurality of custom manufactured parts, comprising:

determining a platform area required by each part of the buildset and determining a total platform area required by the buildset;

comparing the total platform area required by the buildset to an available platform area of a manufacturing machine to determine whether the entire buildset will fit on the platform;

if the entire buildset will not fit on the platform, dividing the buildset into a plurality of subsets small enough for each subset to fit on the platform; and

wherein step (d) [(e)] further includes calculating a firm price quotation for each subset, and summing the subset price quotations to provide a firm price quotation for the entire buildset.

Claim 26(original): The method of claim 25, wherein the dividing step includes:

ordering the parts from largest to least required platform area; and
selecting the largest parts sequentially to make-up the subsets.

Claim 27(currently amended): The method of claim 1, wherein in step (b) [(c)] the CAD file is an STL file.

Claim 28(currently amended): The method of claim 1, being further characterized as a method for providing a firm price quotation for a buildset including a plurality of custom manufactured parts, wherein:

step (c) [(d)] includes:

determining X, Y and Z components for a rectangular box space
enclosing each part; and

optimizing an arrangement of the parts of the buildset within an available volume of a selected manufacturing machine to minimize an overall height of the buildset within the manufacturing machine, the overall height of the buildset being one of the one or more manufacturing criteria; and

step (d) [(e)] includes calculating a firm price quotation for the entire buildset based at least in part upon the overall height of the buildset.

Claim 29(original): The method of claim 1, wherein the one or more manufacturing criteria further includes identification of three-dimensional geometric features relevant to a difficulty of the manufacturing process.

Claim 30(original): The method of claim 29, wherein the three-dimensional geometric features include at least one feature selected from the group consisting of parting lines, undercuts, pockets, protrusions, wall thickness, surface features and solid features.

Claim 31(previously presented): A program stored in a computer readable media for generating binding price quotations for custom manufactured parts comprising:

a CAD file analysis program portion for receiving a pre-existing CAD file describing one or more three-dimensional custom manufactured parts of arbitrary shape, said pre-existing CAD file being constructed independently of the program, and for analyzing the pre-existing CAD file to determine one or more manufacturing

criteria corresponding to each three-dimensional custom manufactured part of arbitrary shape; and

a price generation program portion for generating a binding price quotation based upon the one or more manufacturing criteria when executed by a processor.

Claim 32(original): The program of claim 31, wherein the CAD files are in STL format.

Claim 33(original): The program of claim 31, wherein:

the price generation program portion includes a pricing formula in the form:

$$\text{price} = a * V + b * H + c;$$

where a, b and c are preprogrammed constants;

where V is the volume of each part; and

where H is a vertical dimension of each part in a selected orientation.

Claim 34(original): The program of claim 33, wherein:

the constants a, b and c correspond to a specific business operations facility and are determined by a statistical regression of multiple data points of price data for the specific business operations facility onto the pricing formula.

Claim 35(original): The program of claim 33, wherein:

the selected orientation of the part is selected such that H is minimized and the generated price quotation thus minimized.

Claim 36(original): The program of claim 33, wherein:

the one or more manufacturing criteria determined by the CAD file analysis program portion include a surface area for each part; and

the pricing formula includes a finish charge dependent upon a selected finish and the surface area of the parts.

Claim 37(original): The program of claim 33, wherein:

the pricing formula includes a multiple part charge dependent upon the quantity of parts quoted.

Claim 38(original): The program of claim 31, further comprising:

a feature selection program portion for allowing a user of the program to select one or more features for the parts being quoted.

Claim 39(original): The program of claim 38, wherein the one or more features include:

material;

manufacturing process; and

surface finish.

Claim 40(original): The program of claim 38, wherein:

the feature selection program portion allows a user of the program to select one of a plurality of manufacturing processes to be used to manufacture the parts.

Claim 41(original): The program of claim 40, wherein the plurality of manufacturing processes includes:

- stereo lithography;
- selective laser sintering; and
- fused deposition modeling.

Claim 42(original): The program of claim 40, wherein the plurality of manufacturing processes include:

- at least one additive manufacturing process; and
- at least one formative manufacturing process.

Claim 43(original): The program of claim 31, wherein the one or more manufacturing criteria include:

- volume of each part;
- geometric extents of each part along multiple axes; and
- surface area of each part.

Claim 44(original): The program of claim 43, wherein the one or more manufacturing criteria further includes identification of three-dimensional geometric features relevant to a difficulty of a manufacturing process.

Claim 45(original): The program of claim 44 wherein the three-dimensional geometric features include at least one feature selected from the group consisting of parting lines, undercuts, pockets, protrusion, wall thickness, surface features and solid features.

Claim 46(original): The program of claim 31, further comprising:

an order generation program portion for assembling all electronic files corresponding to a price quotation into a single directory for transmission to a supplier responsible for the quotation.

Claim 47(original): The program of claim 31, further comprising:

a buildset grouping program portion for grouping a plurality of parts making up a buildset into a plurality of subsets of parts, each subset being of a size that will fit upon an available platform area of a selected manufacturing machine.

Claim 48(original): The program of claim 47, wherein:

the price generation program portion calculates a price quotation for each subset, and sums the subset price quotations to generate a binding price quotation for the entire buildset.

Claim 49(original): The program of claim 47, wherein:

the buildset grouping program portion determines a platform area required by each part, orders the parts from largest to least required platform area, and selects the largest parts sequentially to make-up the subsets.

Claim 50(original): The program of claim 31, further comprising:

a buildset grouping program portion for grouping a plurality of parts making up the buildset into a plurality of subsets of parts, each subset being of a size that will fit into an available volume of a selected manufacturing machine.

Claim 51(original): The program of claim 31, further comprising:

a buildset grouping program portion for determining X, Y and Z components for a rectangular box space enclosing each part of a plurality of parts making up a buildset and for then optimizing an arrangement of the parts within the available volume to minimize an overall height of the buildset within the manufacturing machine; and

wherein the price generation program portion includes overall height of the buildset as one of the one or more manufacturing criteria.

Claim 52(previously presented): A method of providing a firm price quotation for a custom manufactured part, comprising:

- (a) loading onto a computer system a pre-existing computer aided design (CAD) file describing a three-dimensional custom manufactured part of arbitrary shape;

- (b) analyzing the pre-existing CAD file on the computer system without human intervention to determine one or more manufacturing criteria for the three-dimensional custom manufactured part of arbitrary shape;
- (c) calculating in the computer system without human intervention a firm price quotation for the three-dimensional custom manufactured part of arbitrary shape based upon the one or more manufacturing criteria; and
- (d) displaying the price quotation.

Claim 53(original): The method of claim 52, wherein:

step (c) is performed substantially instantly with a pre-programmed pricing formula.

Claim 54(original): The method of claim 53, wherein the pricing formula is in the form:

$$\text{price} = a * V + b * H + c;$$

where a, b and c are preprogrammed constants, where V is the volume of the part, and where H is a vertical dimension of the part in a selected orientation.

Claim 55(original): The method of claim 52, further comprising:

prior to step (c) permitting a user to select one of a plurality of available manufacturing processes; and

wherein step (c) includes calculating the price quotation for the selected manufacturing process.

Claim 56(original): The method of claim 52, wherein:

in step (b), the one or more manufacturing criteria includes volume of the part.

Claim 57(original): The method of claim 52, wherein:

in step (b), the one or more manufacturing criteria includes the geometric extent of the part along multiple axes.

Claim 58(original): The method of claim 52, wherein:

in step (b), the one or more manufacturing criteria includes surface area of the part.

Claim 59(original): The method of claim 52, further comprising:

prior to step (c), selecting one of a plurality of available materials; and
wherein step (c) includes calculating the price quotation for the selected material.

Claim 60(original): The method of claim 52, further comprising:

prior to step (c), permitting the client to select one of a plurality of available surface finishes;

wherein in step (b), the one or more manufacturing criteria includes surface area of the part; and

wherein in step (c), the price quotation is dependent upon the selected surface finish and the surface area.

Claim 61(original): The method of claim 52, further comprising:

prior to step (c), permitting the client to select a quantity of the part greater than one; and

wherein step (c) includes calculating the price quotation for the selected quantity, wherein the quantity price per unit is less than the price for a single unit.

Claim 62(original): The method of claim 52, being further characterized as a method for providing a firm price quotation for a buildset including a plurality of custom manufactured parts, comprising:

determining a platform area required by each part of the buildset and determining a total platform area required by the buildset;

comparing the total platform area required by the buildset to an available platform area of a manufacturing machine to determine whether the entire buildset will fit on the platform;

if the entire buildset will not fit on the platform, dividing the buildset into a plurality of subsets small enough for each subset to fit on the platform;

wherein step (c) further includes calculating a firm price quotation for each subset, and summing the subset price quotations to provide a firm price quotation for the entire buildset.

Claim 63(original): The method of claim 62, wherein the dividing step includes:

ordering the parts from largest to least required platform area; and
selecting the largest parts sequentially to make-up the subsets.

Claim 64(original): The method of claim 52, being further characterized as a method for providing a firm price quotation for a buildset including a plurality of custom manufactured parts, wherein:

step (b) includes:

determining X, Y and Z components for a rectangular box space
enclosing each part; and

optimizing an arrangement of the parts of the buildset within an
available volume of a selected manufacturing machine to minimize an overall
height of the buildset within the manufacturing machine, the overall height
of the buildset being one of the one or more manufacturing criteria; and

step (c) includes calculating a firm price quotation for the entire
buildset based at least in part upon the overall height of the buildset.

Claim 65(original): The method of claim 52, wherein the one or more manufacturing criteria further includes identification of three-dimensional geometric features relevant to a difficulty of the manufacturing process.

Claim 66(original): The method of claim 65, wherein the three-dimensional geometric features include at least one feature selected from the group consisting of parting lines, undercuts, pockets, protrusions, wall thickness, surface features and solid features.

Claim 67(previously presented): The method of claim 52, wherein:

the computer system includes both a client computer and a server computer.

Claim 68(previously presented): The method of claim 67, wherein:

the client computer and the server computer communicate with each other over a global communication network.

Claim 69(previously presented): The method of claim 52, wherein:

the computer system includes one and only one computer.

Claim 70(currently amended): A method of providing a firm price quotation for a custom manufactured part, comprising:

- (a) ~~permitting a client to~~ receiving access on a server computer from a client computer over a global communication network;

- (b) loading onto one of the client computer and the server computer a pre-existing computer aided design (CAD) file describing a three-dimensional custom manufactured part of arbitrary shape, said pre-existing CAD file being created by ~~the~~ a client prior to accessing the server computer;
- (c) analyzing the CAD file on said one computer to determine one or more manufacturing criteria for the three-dimensional custom manufactured part of arbitrary shape;
- (d) calculating in the server computer a firm price quotation for the three-dimensional custom manufactured part of arbitrary shape based upon the one or more manufacturing criteria; and
- (e) transmitting the price quotation to the client computer over the global communication network.

Claim 71(currently amended): A method of providing a firm price quotation for a custom manufactured part, comprising:

- (a) ~~permitting a client to~~ receiving access on a server computer system from a client computer over a global communication network;
- (b) uploading from the client computer to the server computer system a pre-existing three-dimensional computer aided design (CAD) file describing a three-dimensional custom manufactured part of arbitrary shape, said pre-existing three-dimensional CAD file being created by ~~the~~ a client prior to accessing the server computer system;

- (c) analyzing the CAD file on the server computer system to determine one or more manufacturing criteria for the three-dimensional custom manufactured part of arbitrary shape; and
- (d) calculating in the server computer system a firm price quotation for the three-dimensional custom manufactured part of arbitrary shape based upon the one or more manufacturing criteria.

Claim 72(currently amended): A method of providing a firm price quotation for a custom manufactured part, comprising:

- (a) loading onto a computer a pre-existing computer aided design (CAD) file describing a three-dimensional custom manufactured part of arbitrary shape, said pre-existing CAD file being independently constructed free of any design restraints ~~restrains~~ imposed by the computer;
- (b) analyzing the pre-existing CAD file on the computer to determine one or more manufacturing criteria for the three-dimensional custom manufactured part of arbitrary shape; and
- (c) calculating a firm price quotation for the three-dimensional custom manufactured part of arbitrary shape based upon the one or more manufacturing criteria.

Claim 73(currently amended): A method of providing a firm price quotation for a custom manufactured part to be manufactured by injection molding of thermoplastic material, comprising:

- (a) ~~permitting a client to~~ receiving access on a server computer system from a client computer over a global communication network;
- (b) uploading from the client computer to the server computer system a pre-existing computer aided design (CAD) file describing a three-dimensional custom manufactured part of arbitrary shape;
- (c) analyzing the CAD file on the server computer system to determine one or more manufacturing criteria for the three-dimensional custom manufactured part of arbitrary shape; and
- (d) calculating a firm price quotation for the three-dimensional custom manufactured part of arbitrary shape based upon the one or more manufacturing criteria, said quotation being based upon both tooling pricing and molded part pricing.